**WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID**: NH581

**Title**: Effects of Biosolids on Groundwater Quality

**Focus Categories**: Nitrate Contamination, Water Quality

**Keywords**: water quality monitoring, waste disposal, sludge, pollutants, nitrogen, heavy metals, groundwater quality

**Start Date**: 03/01/2001

**End Date**: 02/28/2002

**Federal Funds**: $14,439

**Non-Federal Matching Funds**: $24,853

**Congressional District**: 1

**Principal Investigator**:
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**Abstract**

Beneficial re-use of residuals, such as biosolids and short paper fiber, has become an increasingly important topic in both environmental policy and science over the past decade. Reclamation activities, such as those at abandoned gravel pits, provide a way for these secondary products to be recycled back into the environment. However, the same attributes that make this material valuable as an organic material, also may cause deleterious effects to groundwater without proper management and monitoring. Excessively high nitrogen content in biosolids may lead to nitrate concentrations in groundwater that exceed EPA allowable limits and lead to harmful environmental and human health effects. This project assesses the impact of residual application on nitrogen concentrations (nitrate, ammonium, and dissolved organic N) in groundwater at a topsoil manufacturing site in Hooksett, New Hampshire. This site uses biosolids and/or short paper fiber (SPF) to reclaim (re-vegetate) a former gravel pit and subsequently manufacture topsoil. Previous data generated at this site indicates that NO3-N concentrations in groundwater are elevated in the treatment area above those of the control wells and in some cases above the EPA allowable limit for drinking water. However, NO3-N concentrations are highly variable among the treatment wells and seem to be correlated with areas where past stockpiling has occurred at the site.

The primary goal of the project is to demonstrate whether current management and application practices are sufficient to protect groundwater from contamination with NO3-N and other forms of dissolved nitrogen. A secondary goal is to assess levels of trace metals in groundwater at the site. We will also identify ways to improve best management practices (BMPs) and protect groundwater quality. Specifically, we propose to: 1) continue to monitor groundwater for inorganic nitrogen, organic nitrogen and carbon, and trace metals following a heavy biosolids application in late 1999; 2) determine if metals concentrations are positively correlated with nitrate concentrations; 3) determine the time required for nitrate concentrations in all wells to fall below EPA criteria; 4) determine if stockpiling of residuals is positively correlated with available nitrogen in the soil and high nitrate concentrations in groundwater.